

Title Postharvest UV-C irradiation on cut *Freesia hybrida* L. inflorescences suppresses petal specking caused by *Botrytis cinerea*

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Abstract

Postharvest petal specking caused by *Botrytis cinerea* is a major concern for freesia growers and sellers in Holland and the UK. Germicidal and inducible host defence effects of UV-C irradiation were evaluated. UV-C irradiation of freesia inflorescences after artificial inoculation with *B. cinerea* (i.e. the germicidal effect) was more effective in reducing petal specking, compared to UV-C treatment before artificial inoculation (i.e. the defence induction effect). Cut freesia inflorescences exposed to 1 kJ m^{-2} UV-C after artificial inoculation with $10^4 \text{ B. cinerea conidia mL}^{-1}$ displayed reduced disease severity scores, lesion numbers and lesion diameters by 74, 68 and 14%, respectively, compared to non-irradiated control inflorescences. In contrast, UV-C irradiation with 1 kJ m^{-2} before artificial inoculation reduced lesion numbers and lesion diameters by 13 and 24%, compared to the non-irradiated controls. Higher UV-C doses of 2.5 or 5 kJ m^{-2} reduced disease severity scores, lesion numbers and lesion diameters when applied after artificial inoculation, but enhanced disease when applied before artificial inoculation. Vase life of cut freesia inflorescences irradiated with 0.5, 1 or 2.5 kJ m^{-2} UV-C was maintained equal to non-irradiated controls. However, 5 kJ m^{-2} resulted in phytotoxicity evident as petal discoloration and reduced vase life compared to non-irradiated inflorescences.